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研究论文

含聚醚链的Schiff碱锰(III)配合物在胶束溶液中催化BNPP水解反应的研究

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摘要 合成了两种新的聚醚取代的水杨醛亚胺Schiff 碱锰(III)配合物和, 研究了它们与表面活性剂Brij35形成的金属胶束对BNPP的催化水解反应. 探讨了催化反应机理, 提出了水解反应的动力学数学模型; 计算了催化反应的Michanelis常数和表观活化能, 并与不含聚醚链的类似物比较, 考查了配合物配体中聚醚支链及其端基对催化水解反应的影响. 结果表明, 催化水解反应遵循金属-氢氧离子机理; 以羟基作为聚醚链端基的的催化活性最高, 在相同条件下, 其表观一级速率常数约为的3倍, 为的30倍.

关键词 水杨醛亚胺Schiff碱锰(III)配合物 金属胶束 BNPP催化水解 动力学

分类号

Study of the BNPP Hydrolysis Catalyzed by the Schiff Base Magnesium(III) Complexes Bearing Polyether Side Chains in the Micelle Solution

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Abstract Two new Schiff base Mn(III) complexes (and) containing polyether side chains were prepared and used in BNPP hydrolysis as catalyst of metallomicelle resulting from the reaction with Brij35. The mechanism of the catalytic hydrolysis reaction was discussed, a kinetic mathematical model of BNPP cleavage catalyzed by the metallomicelle was proposed, and the Michanelis constant and the apparent active energy of the catalytic reaction were calculated. Compared with polyether side chain-free analogues , the effect of polyether side chains and their terminal groups on catalytic hydrolysis reaction was investigated. The result showed that the catalytic reaction obeyed the mechanism of the metal-hydroxide, and the activity of , which contains hydroxyl group OH as the terminal group of the polyether side chain, is the highest. Under the same condition, the pseudo-first-order rate constant k_{obs} (s^{-1}) of BNPP hydrolysis catalyzed by is about 3 times that of , and about 30 times that of , respectively.

Key words salicylaldimine Schiff base magnesium(III) metallomicelle BNPP catalytic hydrolysis kinetics

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